Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte RICHARD E. WALKER and DEAN MOORE

Appeal No. 1999-1748
Application No. 08/846,285

HEARD: OCTOBER 8, 2002

Before COHEN, ABRAMS, and BAHR, Administrative Patent Judges.
COHEN, Administrative Patent Judge.

DECISION ON APPEAL

The present appeal is taken from the final rejection of claims 1 through 13, 19 through 29, and 35 through 38. Claims 14 through 18 and 30 through 34, the only other claims in the application, stand withdrawn as being drawn to a non-elected species. In the answer (page 2), the examiner indicates that claims 6 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

independent form including all of the limitations of the base claim and any intervening claims. Accordingly, this panel of the board has claims 1 through 5, 7 through 13, 19 through 22, 24 through 29, and 35 through 38 before us for review.

As a preliminary matter, it is pointed out that, based upon circumstances of record (Paper No. 16), we appropriately had to vacate (Paper No. 17) a prior decision in this appeal. The present decision timewise follows the oral hearing held on October 8, 2002, and takes into account the content of appellants' reply brief filed May 19, 1999.

The invention on appeal relates to a method of igniting exothermic weld metal material and to an electrical ignitor for exothermic material. A basic understanding of the invention can be derived from a reading of exemplary claims 1 and 19, respective copies of which appear in APPENDIX "A" of the main brief (Paper No. 13).

As evidence of obviousness, the examiner has relied upon the documents listed below:

Dahn et al (Dahn)	3,669,022	Jun. 13, 1972
Lee et al (Lee)	H464 (Statutory Invention Registration)	May 3, 1988

The following rejection is the sole rejection before us on appeal.[1]

Claims 1 through 5, 7 through 13, 19 through 22, 24 through 29, and 35 through 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lee in view of Dahn.

The examiner's rejection and response to the argument presented by appellants appears in the final rejection and the answer (Paper Nos. 9 and 14), while appellants' argument on appeal can be found in the main brief having appendices A, B, C, and D (Paper No. 13) and the reply brief filed May 19, 1999.

[1] Each of the other three rejections found in sections 7 through 9 of the final rejection (Paper No. 9) have been expressly withdrawn by the examiner (answer, page 9).

OPINION

In reaching our conclusion on the obviousness issue raised in this appeal, this panel of the board has carefully considered appellants' specification and claims,[2] the applied teachings,[3] and the respective viewpoints of appellants and the examiner. As a consequence of our review, we make the determinations which follow.

[2] We comprehend the metes and bounds of the claims on appeal notwithstanding the presence therein of certain language as follows. As to claim 1 and claim 19, we understand, in light of appellants' disclosure, that impressed or applied voltage creates spark plasma in conjunction with the metal foil ignitor or strip (perforation distortion), rather than each of voltage and the strip individually creating spark plasma as set forth. In claim 19, line 3, obviously "said perforation" should be --said perforation distortion--.

[3] In our evaluation of the applied prior art, we have considered all of the disclosure of each document for what it would have fairly taught one of ordinary skill in the art. See In re Boe, 355 F.2d 961, 965, 148 USPQ 507, 510 (CCPA 1966). Additionally, this panel of the board has taken into account not only the specific teachings, but also the inferences which one skilled in the art would reasonably have been expected to draw from the disclosure. See In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

At the outset, we recognize from a reading of appellants' disclosure (specification, pages 1 through 3) that, prior to the present invention, it was known to initiate an exothermic reaction in a mixture of copper oxide and aluminum, for example, by an ignitor such as a flint ignitor, by an electrical system which ranges from simple spark gaps to bridge wires and foils, and by rocket ignitors to yield molten copper weld metal to join or weld copper to copper or steel to steel.

We turn now to the claims under rejection.

METHOD CLAIMS

This panel of the board cannot sustain the rejection of independent method claim 1 and claims 2 through 5 and 7 through 13 dependent thereon.

Independent claim 1 sets forth a method of igniting exothermic weld metal material comprising, inter alia, the steps of forming a charge of weld metal material, placing a

spark plasma creating metal foil ignitor in ignition relationship with the charge, and igniting the charge to convert the exothermic weld metal material to weld metal.

Simply stated, it is our point of view that one having ordinary skill in the art at issue would not have considered the molten metal-liquid explosive device of Lee to carry out a method of igniting exothermic weld material to convert the weld material to weld metal, as set forth in method claim 1. Thus, even with the Lee device modified to replace the ignition coil 30 with the thin film device of Dahn, as proposed by the examiner, the now claimed method would not be attained. It is for this reason that the rejection of claim 1 and claims dependent therefrom cannot be sustained.

ARTICLE AND COMBINATION CLAIMS

We sustain the rejection of claims 19 through 22, 24 through 29, and 35 through 38.

Initially, we note that, as disclosed (specification, page 4), an ignitor includes one or more "distortions" in the form of

one or more "holes" formed by a punch. The "holes" are also referred to as "disruptions" (specification, page 5). As explained in the specification (page 10), being "a punched perforation, the hole has characteristics of punching which distorts the linear nature of the assembly providing slightly folded or jagged edges and an attenuated insulation of the hole."

Independent claim 19 recites an electrical ignitor for exothermic material comprising a metal foil strip, a perforation distortion[4] in the strip operative to create spark plasma across the perforation sufficient to ignite the material, and means to apply voltage to the strip to create spark plasma across the perforation distortion.

[4] The term "perforation distortion" is not found in appellants' specification, as filed, but appears in the claims as per an amendment (Paper No. 8). A perforation is a hole made by or as if by piercing or boring, with the word perforate denoting a passing through or into by or as if by making a hole (to penetrate a surface). A hole is defined as an opening often forced into or through a thing. A distortion is understood to broadly be a twisting out of (or deformation in) a normal or original shape. Webster's New Collegiate Dictionary, G. & C. Merriam Company, Springfield, Massachusetts. Consistent with the underlying disclosure, a "perforation distortion" may be fairly and reasonably viewed as broadly characterizing some form of a hole or opening in an otherwise originally shaped metal foil strip.

At this time, it is well worthy of noting appellants' belief as to the phenomena taking place in practicing the present invention (specification, page 10; the precise mechanics acknowledged by appellants as not being known) wherein, responsive to electrical energy discharge from a capacitor, molten copper at the edge of a conical hole "vaporizes" (page 10) producing a resultant "shock wave" (page 11) of spark plasma. Akin to appellants' ignitor configuration and belief as above, the patentee Dahn explicitly teaches a thin film device employed as a fuse (fuze) wherein, responsive to an electrical signal, bridging elements in a pin hole "vaporize" (column 2, lines 65, 66) and produce a "shock wave" (column 2, line 66). While appellants use the terminology "spark plasma" and Dahn does not, it nevertheless appears to us that the vapor shock wave of Dahn would be readily appreciated by those having ordinary skill in the art as corresponding to appellants' shock wave of spark plasma (appellants' specification, page 11). The Lee patent indicates that an ignition coil 30, or conventional igniter systems (column 4, lines 48 through 59), can be utilized.

In applying the test for obviousness,[5] we conclude that it would have been obvious to one having ordinary skill in the art, from a combined assessment of the Lee and Dahn teachings, to replace the ignition coil 30 of Lee (Figs. 1 through 3) with a thin film device (fuse or detonation initiation mechanism). As we see it, the incentive on the part of one having ordinary skill in the art for making the proposed modification would have simply been to gain the self-evident benefits of the alternative thin film device (fuse) disclosed by Dahn. Thus, we determine that the rejection of claim 19 under 35 U.S.C. § 103(a) is sound. It is also clear to us that the Dahn teaching would have been reasonably suggestive of the broadly recited subject matter of each of claims 20 through 22, 24 through 29, and 35 through 38. As to claims 22 and 25 through 27, it is apparent to us that those having ordinary skill in the art would have understood the pin holes of a diameter of about 10 microns in the thin film device (column 2, lines 15 through 27) disclosed by Dahn as perforations generally conical in shape (Figs. 1 and 2), and

[5] The test for obviousness is what the combined teachings of references would have suggested to one of ordinary skill in the art. See In re Young, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991) and In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

capable of creating a spark plasma on both side of the thin film device and broadcasting spark plasma a substantial distance in at least one direction. As above, and like the examiner (answer, page 7), we have viewed the shaped configuration of the thin film device of Dahn as capable of creating a spark plasma on both sides thereof (claim 26). With respect to combination claims 28 and 29, we perceive that the intimate contact teaching (column 2, lines 66 through 69) of Dahn would have been suggestive to those having ordinary skill in the art of a perforation distortion adjacent to and immersed in exothermic material. Finally, relative to claims 35 through 39, we are of the view that one having ordinary skill, comprehending the teaching of holes (Figs. 1 and 2) formed by the removal of beads of different shapes such as spheres and fibers by Dahn (column 1, lines 63 and 64 and column 2, lines 24 through 26), would have considered this teaching as reasonably suggestive of a perforation distortion at a single site or multiple sites, and of holes having substantially equal or unequal characteristics as broadly claimed.

The arguments advanced by appellants in the main (pages 15 and 16) and reply briefs fail to persuade us as to error on the

part of the examiner in rejecting claims 19 through 22, 24 through 29, and 35 through 38.

As to claim 19, in particular, appellants assert (main brief, page 15) that

> Neither the primary nor the secondary reference discloses a metal foil ignitor having a perforation distortion. Both references are simple bridge elements, and neither reference relates the perforation to the creation of the spark plasma across the perforation. The vaporization of a bridge element is not such spark plasma-creating perforation.

Contrary to appellants' stated point of view above, and in the reply brief (page 3), we readily perceive that the three layer thin film device of Dahn with pin holes 16 through metallic conductive layer (film) 10 and insulating layer 14, and bridge element coating 18 (Fig. 2) would have been appreciated by one having ordinary skill in the art as a metal foil ignitor having a perforation distortion. Broad article claim 19 does not set forth a perforation distortion passing entirely through the electrical ignitor, as disclosed. Further, appellants' article claims do not preclude the presence of a bridge element coating. As earlier indicated, appellants acknowledge in the specification

(page 10) that, as to the depicted phenomena of Figures 7 through 10 (spark plasma), the precise mechanics thereof are not known. With this in mind, we consider the examiner's spark plasma analysis (answer, page 6), leading to the conclusion that appellants' process and the Dahn process are "nearly identical", to be both reasonable and supportive of the view that Dahn would have been suggestive of the claimed perforation distortion creating a spark plasma thereacross. Again contrary to the argument that the features of claims 24, 25, 26 and 27 are not found in the secondary reference (main brief, page 15), we determined above that the evidence of obviousness would have been suggestive of the content of these claims. Similarly, and as explained above relative to claims 28, 29, and 35 through 39, we disagree with the viewpoint (main brief, page 16) that these claims are patentable over the applied references.

REMAND TO THE EXAMINER

We remand this application to the examiner to consider the following matters.

The examiner should evaluate the patentability of appellants' method claims under 35 U.S.C. § 103(a) based upon the acknowledged prior art methods converting exothermic weld metal material to weld metal (appellants' specification, pages 1 through 3) and the teaching of Dahn.

The examiner should review dependent article claim 23 and ascertain whether the method recitation "is punched and shaped" imparts to the "perforation distortion" structure a characteristic that distinguishes the perforation distortion from the pin holes effected by the removal of the beads of Dahn.

The examiner may also consider remedying the following perceived informalities. Claim 22 appears to redundantly recite a perforation when a "perforation" distortion is set forth in claim 19. As to holes having "substantially equal" characteristics (claim 37), they appear to be the same as holes having "unequal" characteristics (claim 38).

In summary, this panel of the board has not sustained the rejection of claims 1 through 5, 7 through 13, but has sustained the rejection of 19 through 22, 24 through 29, and 35 through 38 under 35 U.S.C. § 103(a) as being unpatentable over Lee in view of Dahn. Additionally, we have remanded the application to the examiner to review the matters specified above.

The decision of the examiner is affirmed-in-part.

In addition to affirming the examiner's rejection of one or more claims, this decision contains a remand. 37 CFR § 1.196(e) provides that

> whenever a decision of the Board of Patent Appeals and Interferences includes or allows a remand, that decision shall not be considered a final decision. When appropriate, upon conclusion of proceedings on remand before the examiner, that Board of Patent Appeals and Interferences may enter an order otherwise making its decision final.

Regarding any affirmed rejection, 37 CFR § 1.197(b) provides:

> (b) Appellant may file a single request for rehearing within two months from the date of the original decision . . . .

The effective date of the affirmance is deferred until conclusion of the proceeding before the examiner unless, as a mere incident to the limited proceedings, the affirmed rejection is overcome. If the proceedings before the examiner does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeal and Interferences for final action on the affirmed rejection including any timely request for rehearing thereof.

This application, by virtue of its "special" status, requires immediate action MPEP § 7058.01(d). It is important that the Board be informed promptly of any action affecting the appeal in this case.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART AND REMANDED

IRWIN CHARLES COHEN Administrative Patent Judge	)	
NEAL E. ABRAMS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JENNIFER D. BAHR Administrative Patent Judge	)	

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